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CC	RON@GHZDATA.COM
FROM	RONALD B. MILLER
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ATTN: ART UNIT 2841
Ishwar Patel

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Monday, Dec 26, 2005

COMMISSIONER FOR PATENTS
PO BOX 1450
Alexandria VA 22313-1450Attn: Ishwar Patel, Examiner
Art Unit 2841
RE: 10/601/464

Dear Mr Patel,

It is obvious that you are confused about the intent and the substance of the patent application I have files.

GENERAL DISCUSSION AND OVERVIEW OF THIS PATENT

This does not reflect on your technical competence but rather on the nature of the patent and the depth of the substance. In the broadest but simplest sense:

- printed circuit boards are used to connect electronic components
- all electrical connections are transmission lines
- printed circuit boards use dielectric materials
 - for mechanical support
 - and for insulation of the electrical connections

These dielectric materials have electrical properties which limit high-frequency high-data rate performance:

- Dielectric constant(ϵ_r) – 3 to 4 limits speed of travel to $V_s/\sqrt{\epsilon_r} \sim 1/2$
 - V_s = Velocity of free space 300 Million Meters/Second
- Dielectric loss tangent($\tan \delta$) attenuates high frequency signals.
- Both ϵ_r and $\tan \delta$ are frequency causing dispersion of the waveform
- Dispersion of the waveform causes slow rise-time and fall-time
- Slow rise-time And slow fall-time at high data rates into the Gigabit per second(GBS) range, result in slewing the data bits together which causes data errors making error-free-transmission impossible.

Air dielectric provides the optimum high-data rate performance.

- Dielectric constant is 1 so that the speed of travel is V_s
- Dielectric Loss tangent is 0
- Neither of these factors have frequency dependency, so dispersion and slewing of the data do not occur.
- High-Data rate performance is optimum.

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This patent is for a structure which eliminates most of the distortion and dispersion on high-speed GBS data by replacing most of the dielectric material with air. For comparison, consider the construction of coaxial cable. There is a conductor down the center of a conductive tube. The conductor down the center of the tube is the primary signal, and the ground return is through the outside conductor. In most cases the space between the center conductor and the outside shield is filled with dielectric material.

However for high frequency use, air dielectric is used instead of the dielectric material to the extent possible. Dielectric material is still needed for mechanical positioning of the center conductor through the tube. One method is Heliac cable which has a spiral dielectric spacer twisting down the length of the cable. Another method is to use foamed Dielectric which can be up to 90 percent air. W.L. Gore is the main manufacturer of this material.

In a similar fashion, this patent provides a mechanical method for substituting air for much of the dielectric material used around electrical interconnecting conductors within a printed circuit board.

Present technology being used to fabricate printed circuit boards seek to eliminate air from inside the boards in order to prevent de-lamination and mechanical damage caused by expansion of the air and any moisture it may contain.

This patent includes the provision for pressure relief from the inside air to the outside air so that damage and de-lamination will not occur.

RESPONSE TO OFFICE ACTION SUMMARY SENT ON 11/29/2005

Page 2 DETAILED ACTION paragraph 1.

Please recognize that I am not a patent attorney, and that I have agreed to the withdrawal of claims 1-4, 7, 13, 14, and 17 on the advice of the patent examiner, who has assured me that no one can use these methods of fabrication of this self same structure if the main patent claims are granted.

Information Disclosure Statement Paragraph 2

Specification Paragraph 3

You state that the abstract is in two paragraphs.

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